San Joaquin River Salt and Boron TMDL Progress Update

1 March 2001

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Workshop Agenda

- Welcome and Introductions
- Overview of Regional Board's TMDL Development Process and Timelines
- Petition to Revoke the Waiver on Agricultural Return Flows
- Salt and Boron Basin Plan Amendment-- Status
- Salt and Boron TMDL -- Status

Overview of Regional Board's TMDL Development Process and Timelines

What Is a TMDL and Why Do One?

- TMDL = Total Maximum Daily Load
- TMDLs are required under section 303(d) of the Federal Clean Water Act
  - TMDLs must be developed for pollutants and waterbodies that have been identified on 303(d) list of impaired waterbodies

What Is a TMDL?

- A total maximum daily load (TMDL) is the amount of a specific pollutant that a waterbody can receive and still maintain a water quality standard
- TMDLs allocate pollutant loads to point and nonpoint sources…

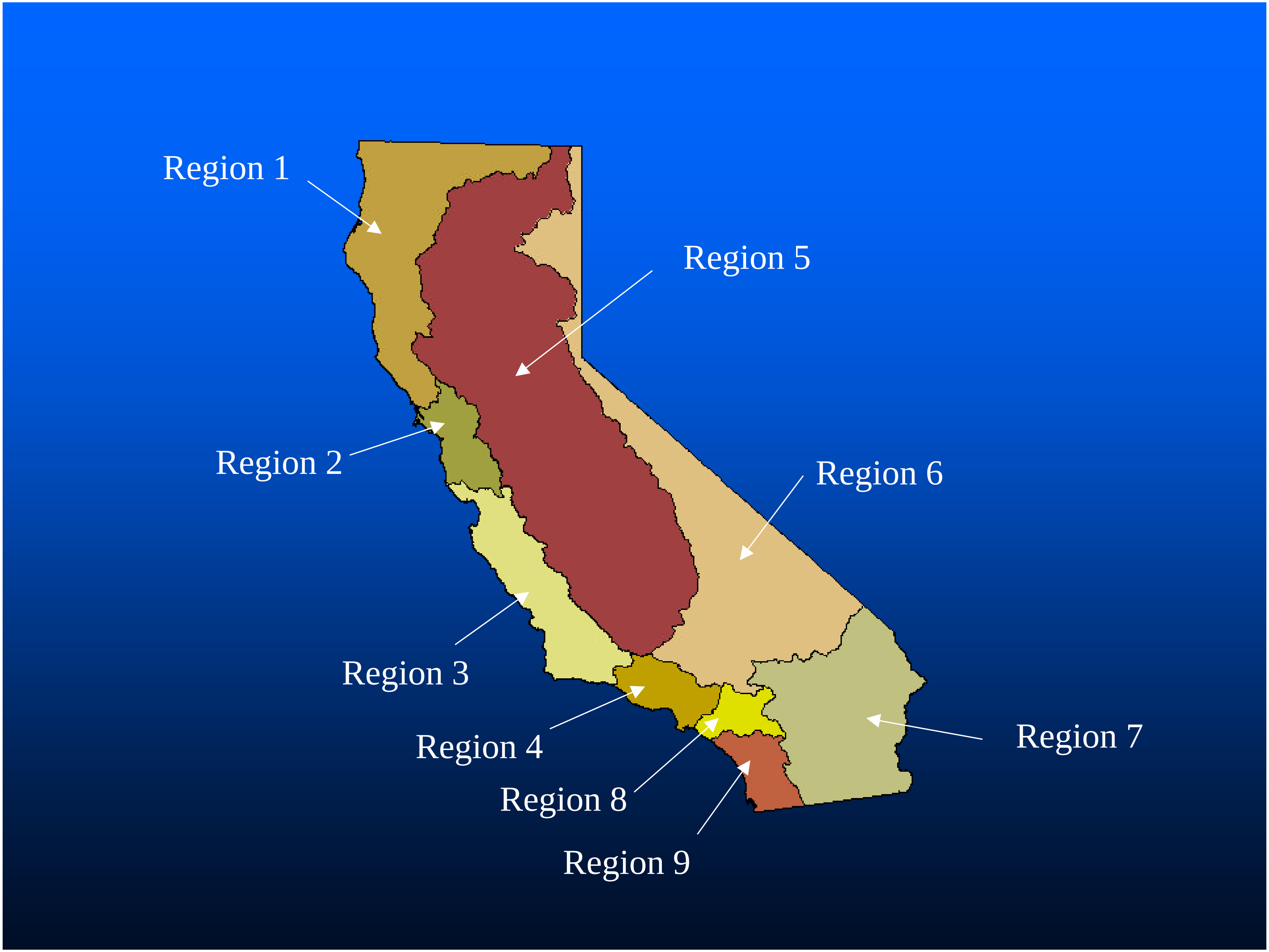
What Is a TMDL?

- TMDL = WLA + LA + MOS + background

WLA:	waste load allocation for point sources
LA:	load allocations for nonpoint sources
MOS:	margin of safety

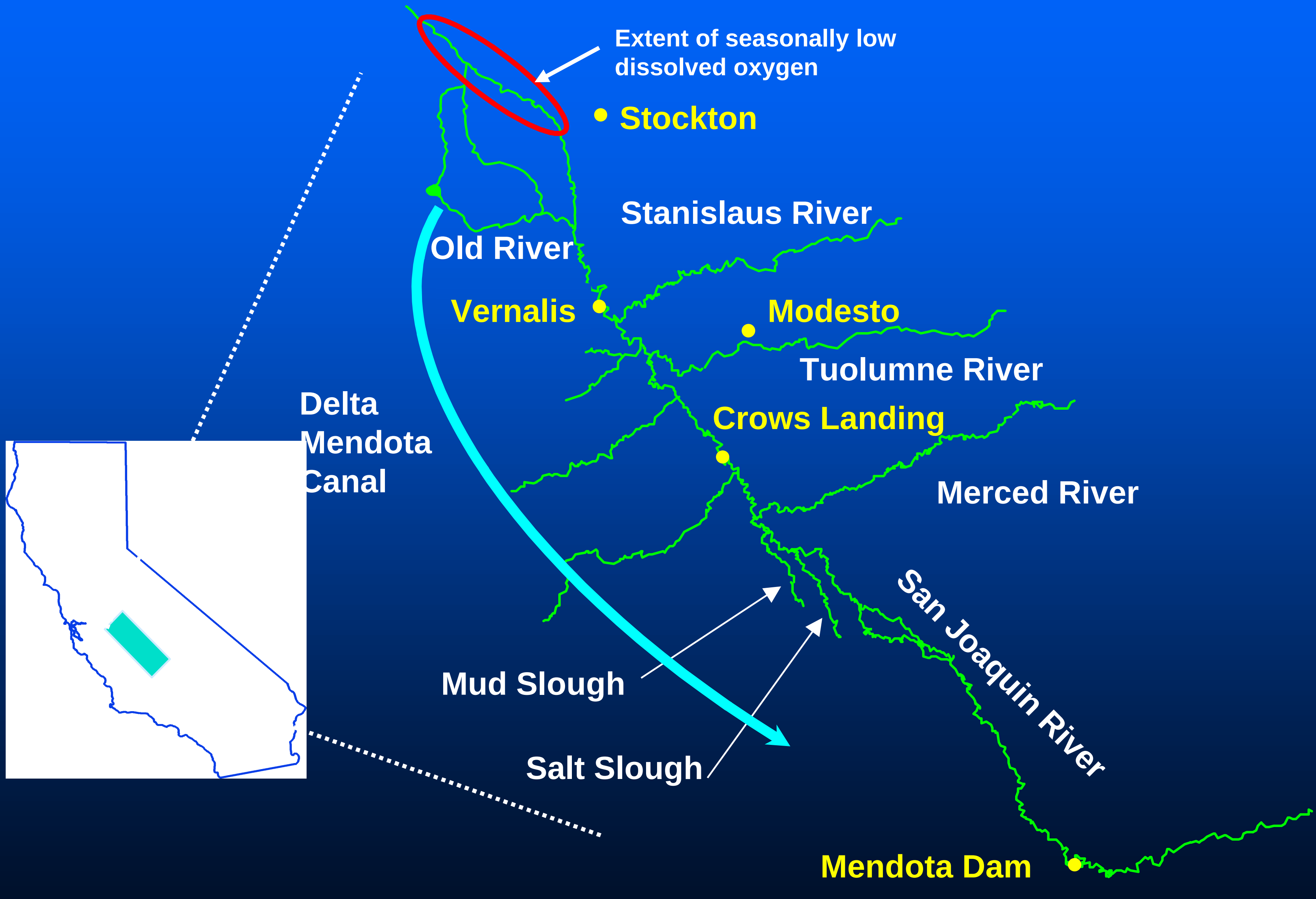
Components of TMDLs

- TMDL Description (Problem Statement)
- Numeric Targets (will often be new water quality objectives)
- Source Analysis
- Allocations
- Linkage Analysis (relationship between sources, allocations, and targets)
- TMDL Report
- *Implementation Plan*


Region 1
Region 5
Region 2
Region 6
Region 3
Region 7
Region 4
Region 8
Region 9


Region 5
San Joaquin River Basin

Lower San Joaquin River Basin



TMDL Timeline

Current Activities

Watershed	June 2001	June 2002	June 2003
San Joaquin River	Selenium Salt & boron	Diazinon & chlorpyrifos	
Delta			Dissolved oxygen Diazinon & chlorpyrifos Mercury
Sacramento River	Copper, zinc, & cadmium	Diazinon	
Clear Lake	Mercury		
Cache Creek		Mercury	

Petition to Revoke the Waiver on Agricultural Return Flows

A Status Report

Petition

- Submitted 28 November 2000 by Earthjustice Legal Defense Fund on behalf of WaterKeepers Northern California (DeltaKeeper and San Francisco BayKeeper) and California Public Interest Research Group
- Seeks termination of waiver of WDRs for pesticide-laden irrigation return water
  - Seeks a hearing within 60 days of petition
- Informational Item Held before Regional Board 26 January 2001

Irrigation Return Water

- 7 million acres of irrigated agriculture in Central Valley
- Tens of thousands of individual discharges
  - Over 340 water agencies
- Potentially contains pesticides and other pollutants
- Seasonally dominates water quality in many lower valley surface waters

Water Bodies Dominated by Irrigation Return Flows

- 160 Natural Water Bodies
  - 1,512 miles
- 6,319 Constructed Water Bodies
  - 19,812 miles

Petition

- Extensive appendix
- Transmittal letter signed by 67 organizations
- Many phone calls and comment letters received

California Water Code

- Waste Discharge Requirements are the main tool for controlling discharges
- Section 13269 allows the Board to waive WDRs if it is not against public interest
- New provision:
  - existing waivers sunset on 1 January 2003
- Board may adopt new waivers after compliance with CEQA
- New waivers must be renewed every 5 years

Resolution No. 82-036

- Adopted in 1982
- Conditionally waives WDRs for 23 categories of discharges
- Waivers may be terminated at any time

Waiver Conditions for Irrigation Return Waters

"Operating to minimize sediment to meet Basin Plan turbidity objectives and to prevent concentrations of materials toxic to fish and wildlife."

Current Status

- Informational Item Held before Regional Board 26 January 2001
- Board directed staff to evaluate merits of petition and review waiver program
  - Identify methods for regulating irrigation return flows
- Public Workshop will be held in July

Issues

- State Board and Regional Board guidance and policies
- Department of Pesticide Regulation’s program
- Impacts of irrigation return waters
- Recommendations of petitioners and others
- Resource issues…

Salt and Boron Basin Plan Amendment

A Status Report

Salt and Boron Basin Plan Amendment

- Last workshop 16 August 2000; Regional Board staff presented:
  - Draft Water Quality Objectives
    (range of possible WQOs)
  - Draft Program of Implementation
- Verbal and written comments received

More Information

- Salt and Boron Basin Plan Amendment:

  http://www.swrcb.ca.gov/~rwqcb5/salt_boron/documents.html

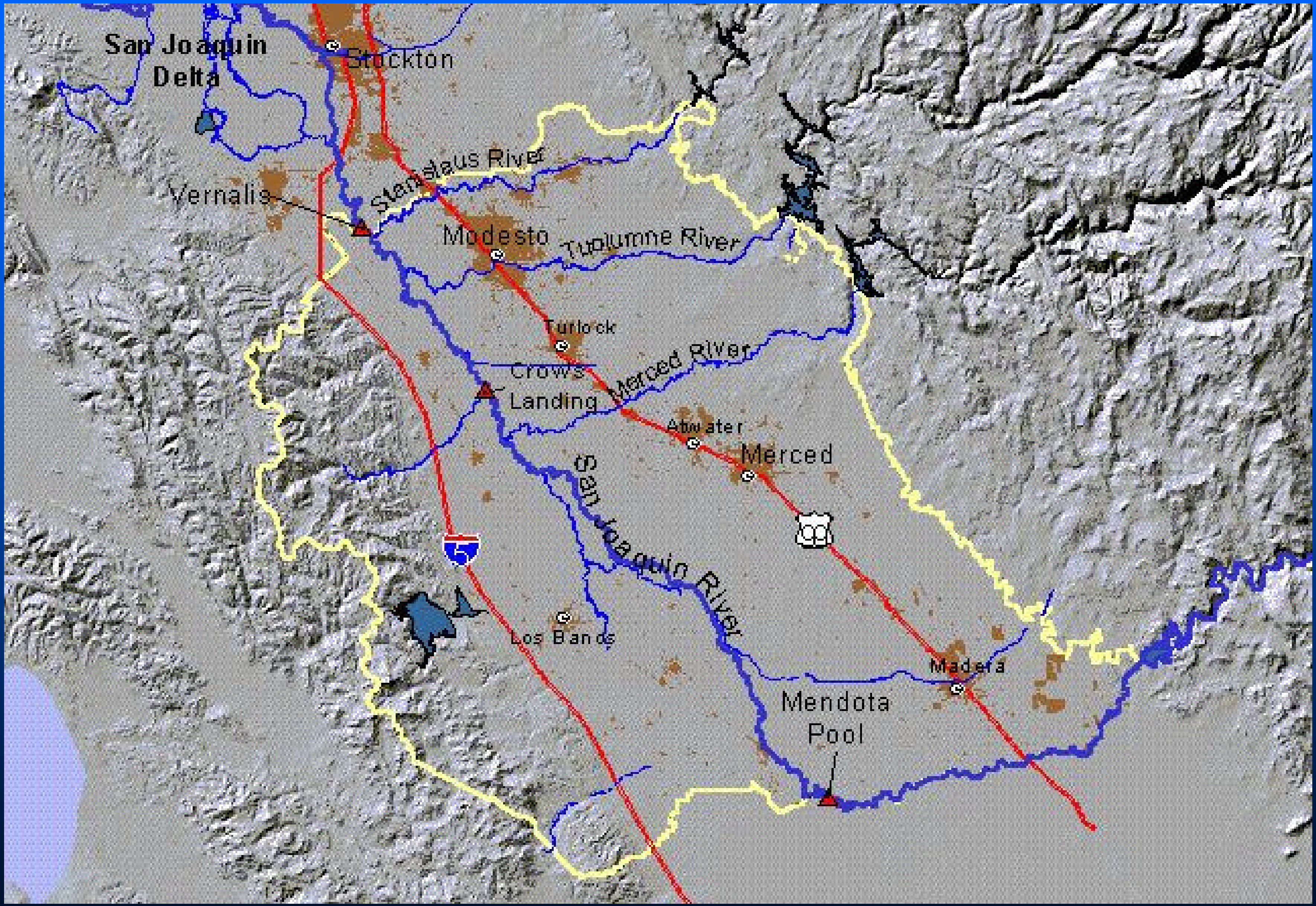
- TMDL Program:

  http://www.swrcb.ca.gov/~rwqcb5/TMDL/index.htm

San Joaquin River TMDL for Salinity and Boron

Status and Approaches for TMDL Development

Project Area for Salinity and Boron TMDL



Timelines

- Technical work for salinity and boron TMDL to be completed by June 2001

TMDL Components

- Problem Statement
- Numeric Targets
- Source Analysis
- Loading Capacity
- Load Allocations

- Implementation Plan

TMDL Numeric Targets

Objective:

Establish TMDL the end-points or goals which result in attainment of water quality objectives

Approach:

- Use existing Vernalis Water Quality Objectives for salinity and use the USEPA secondary drinking water MCL for boron at Vernalis
- Eventually TMDL will need be updated when the Salt and Boron objectives are updated under the Basin Plan Amendment process.

Salinity and Boron Numeric Targets at Vernalis

	Irrigation Season (April-Sept.)	Non-Irrigation Season (October-March)
Salinity	**700 (µS/cm)**	**1000 (µS/cm)**
Boron	**0.6 (mg/L)**	**0.6 (mg/L)**

TMDL Source Analysis

Objective:

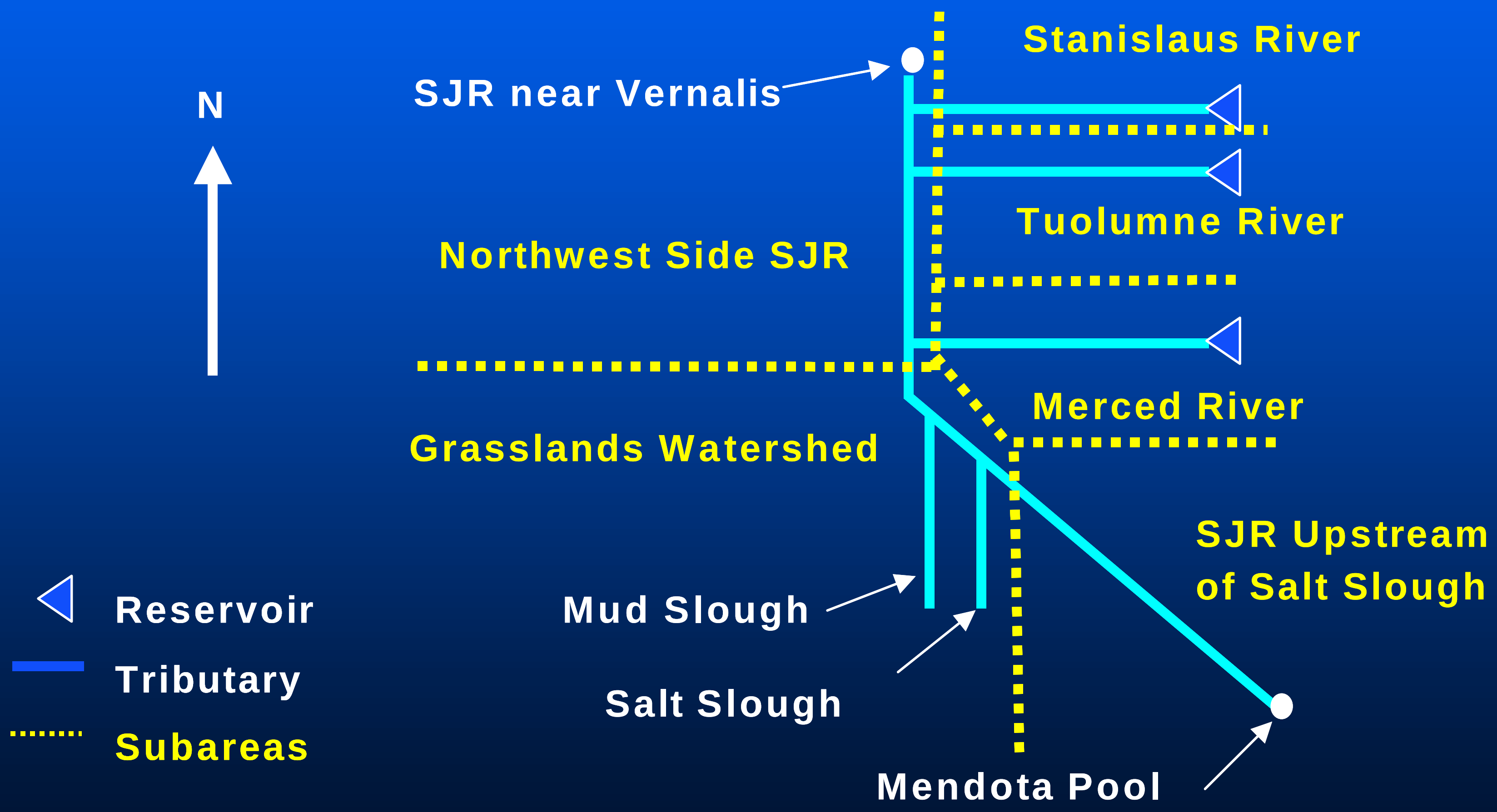
Determine the quantity and location of the sources of salt and boron loading in the watershed

Ensure that all significant sources will be addressed so that load allocations result in achievement of Numeric Targets

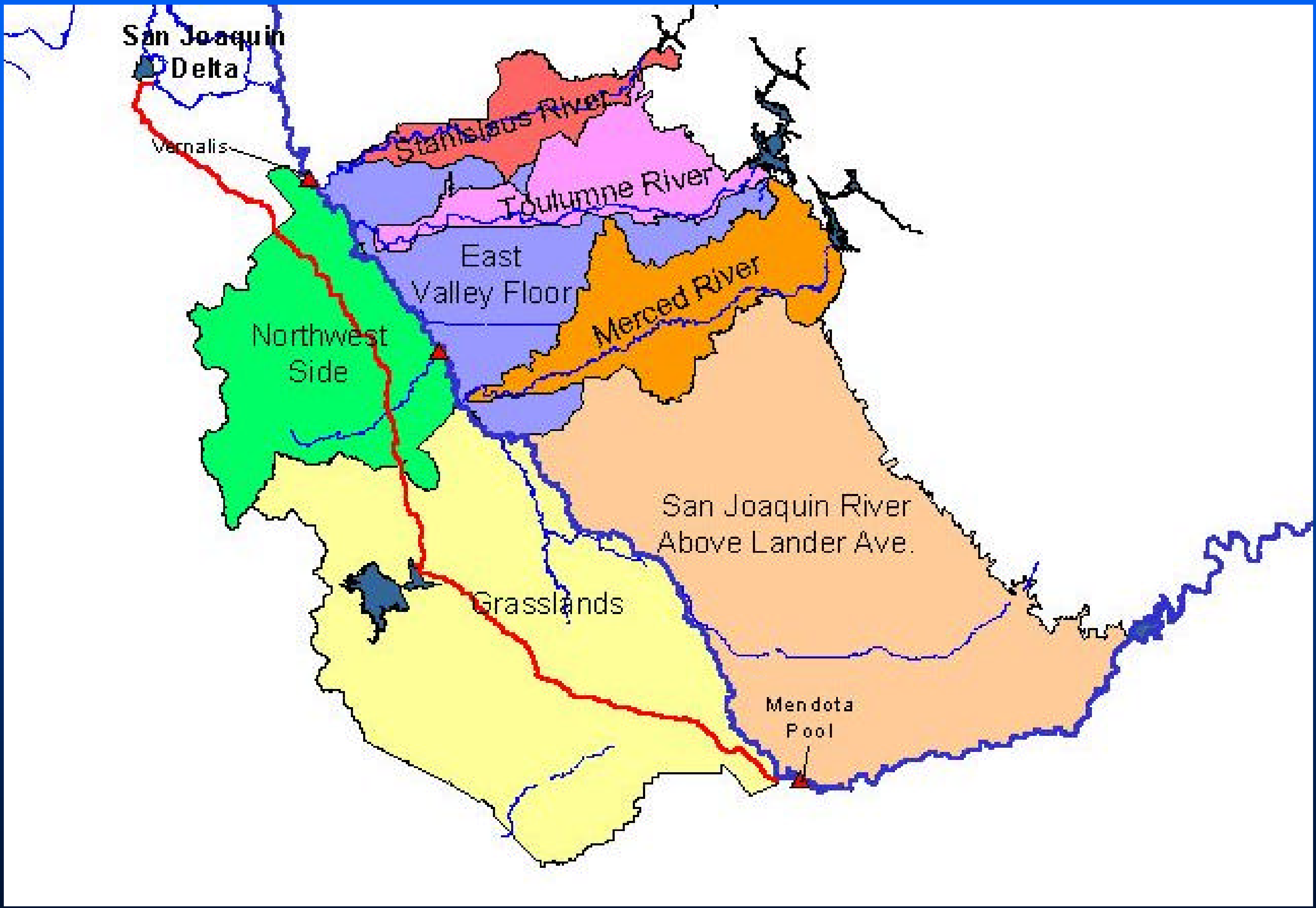
Approach:

- Divide the watershed into geographic sub-areas
- Use monitoring data and modeling to determine loading from sub-areas and source types.

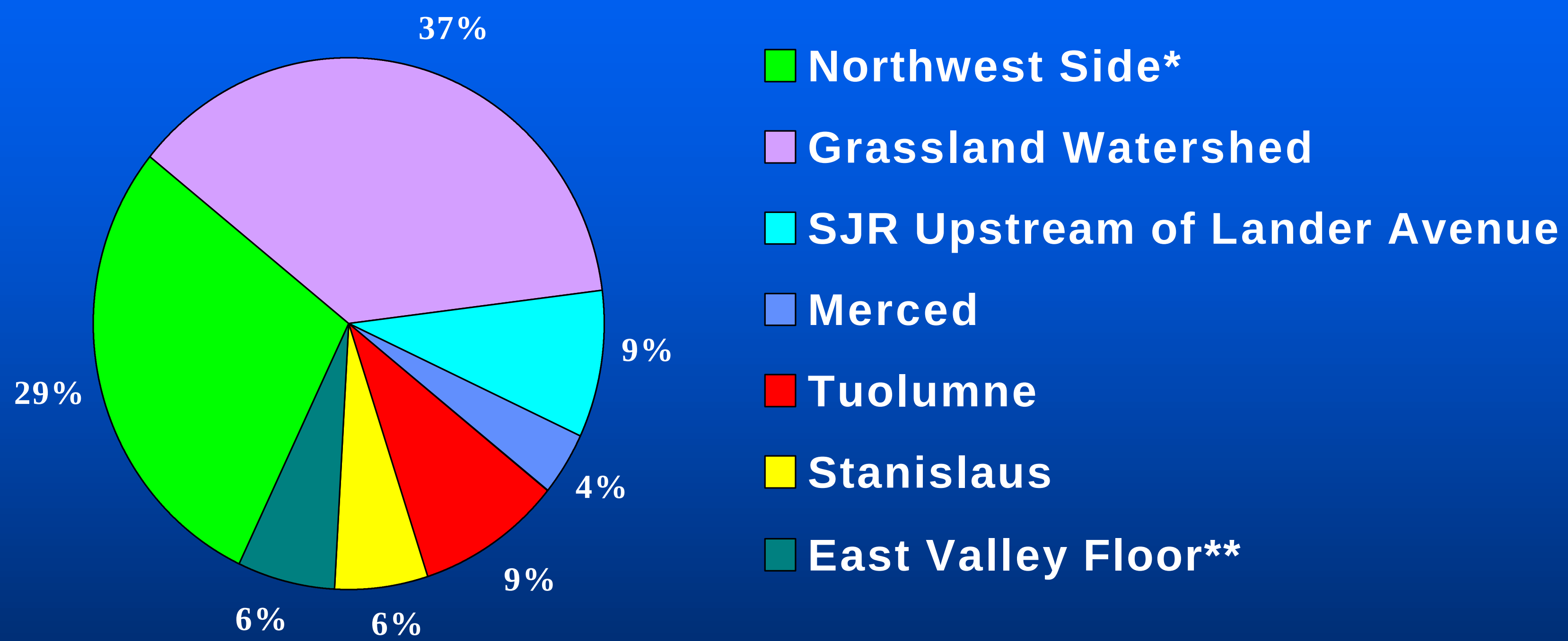
Lower San Joaquin River Basin Subareas



Lower San Joaquin River Basin Subareas



Sources of Salt (by sub-area)

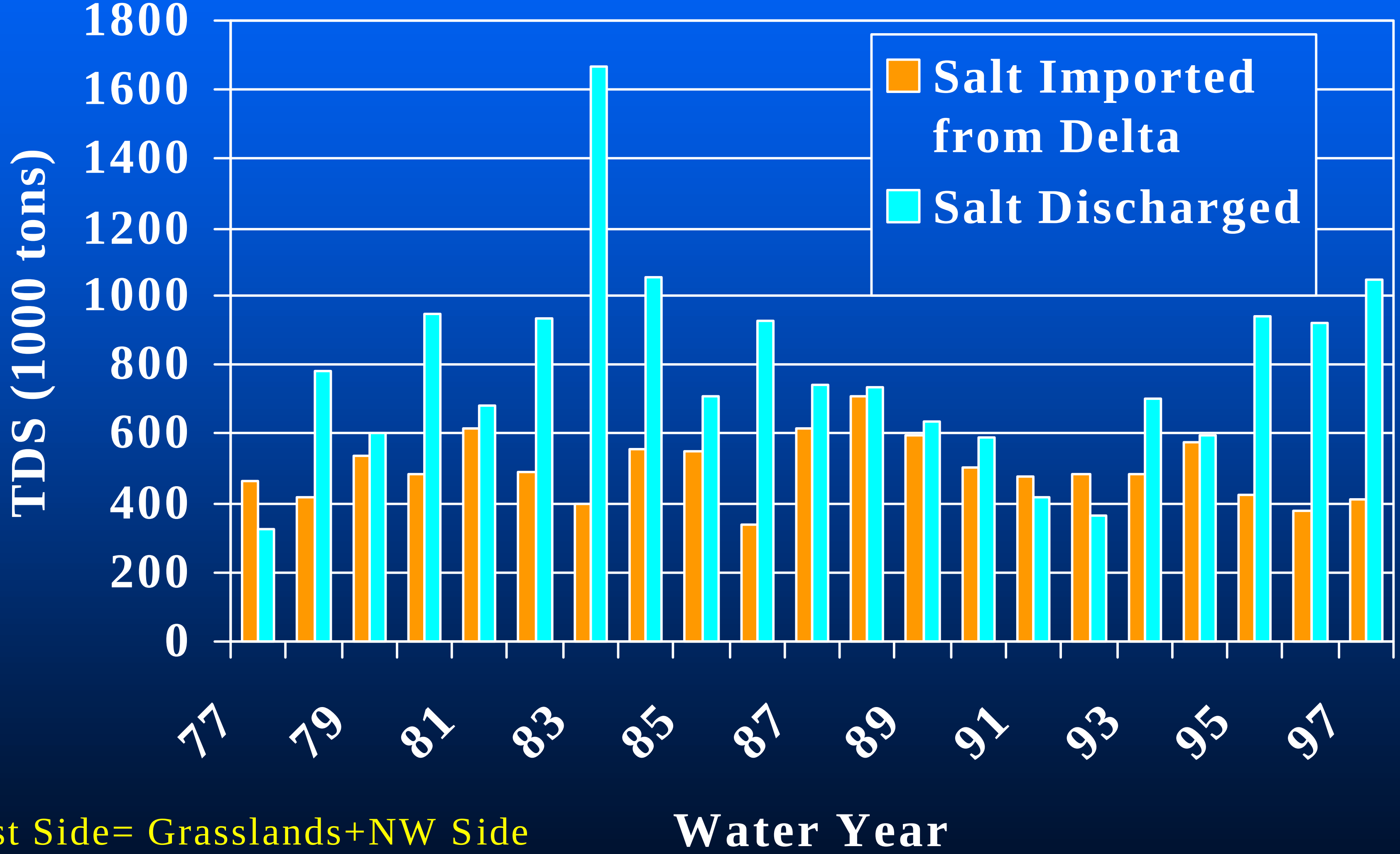


Mean Annual Salt Load to SJR for WY 1977 to 1997: 1.1 million tons

*Northwest Side estimated by difference :Vernalis minus sum of other sources

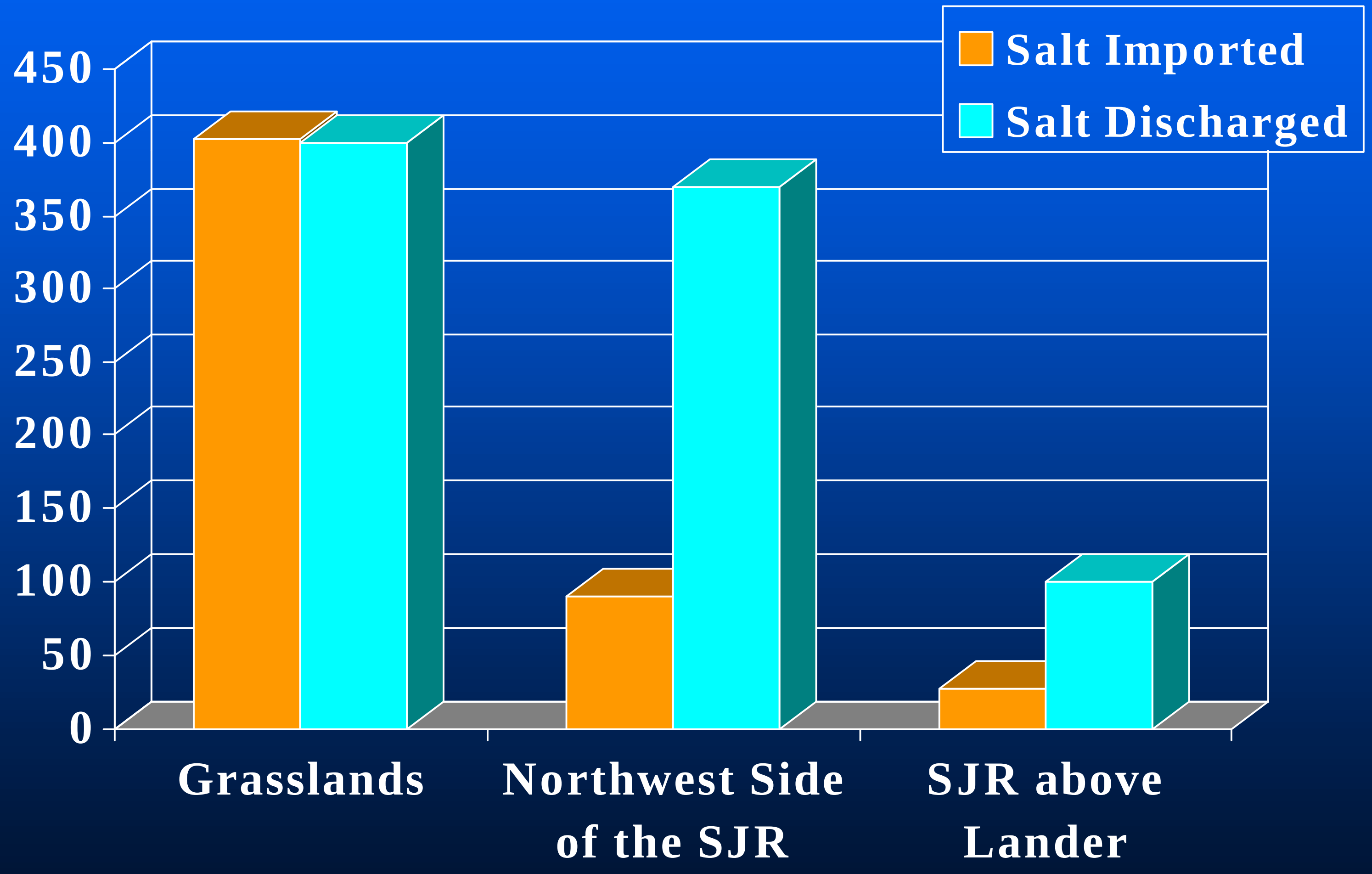
** East Valley Floor extrapolated from TID 5 data (1985-1996)

TDS Imported and Discharged from the West Side* of the LSJR

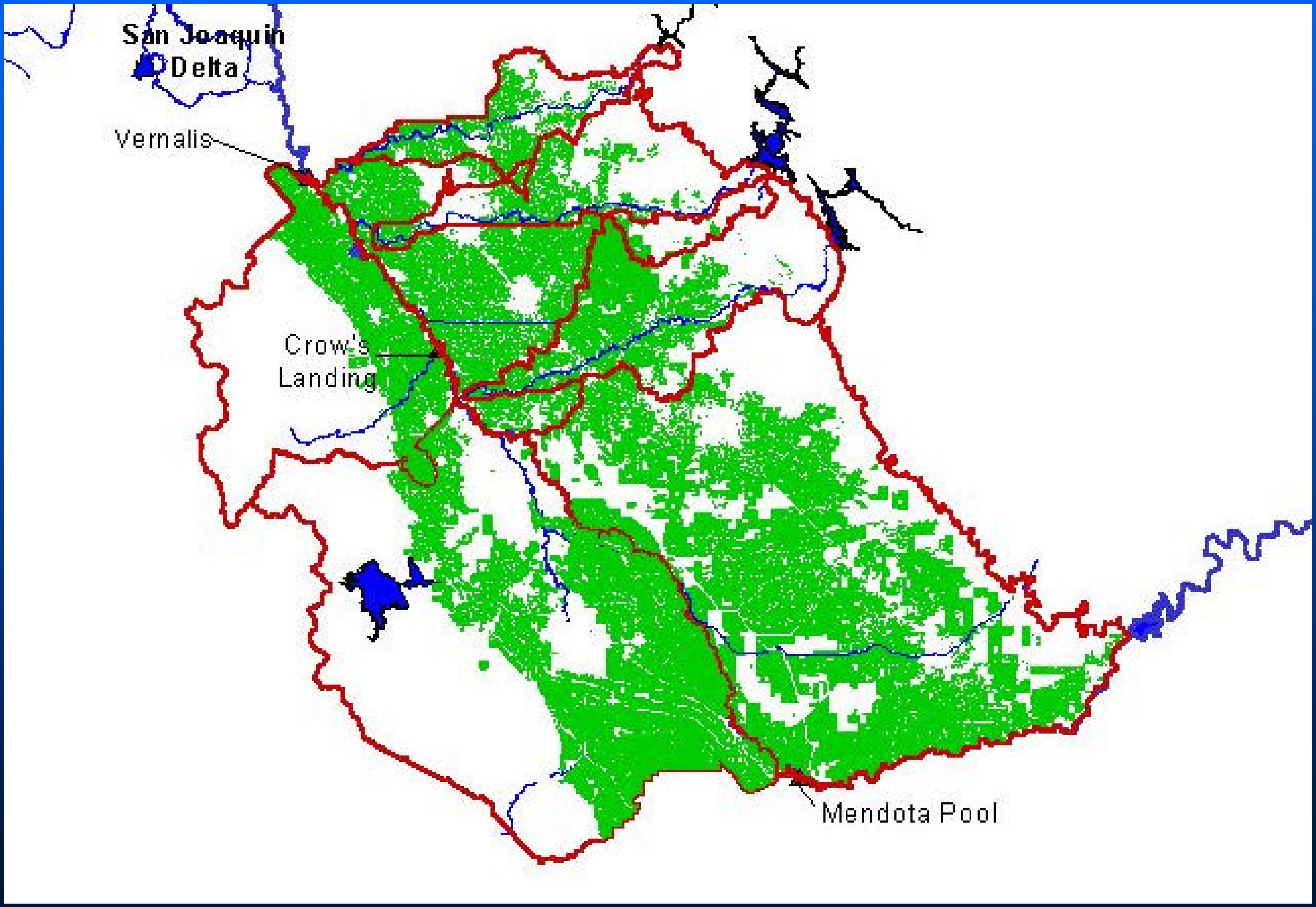


*West Side= Grasslands+NW Side sub-areas

Average Annual TDS Imported and Discharged from LJSR Sub-areas 1977-1997



Agricultural Land Use in the Lower San Joaquin River Basin



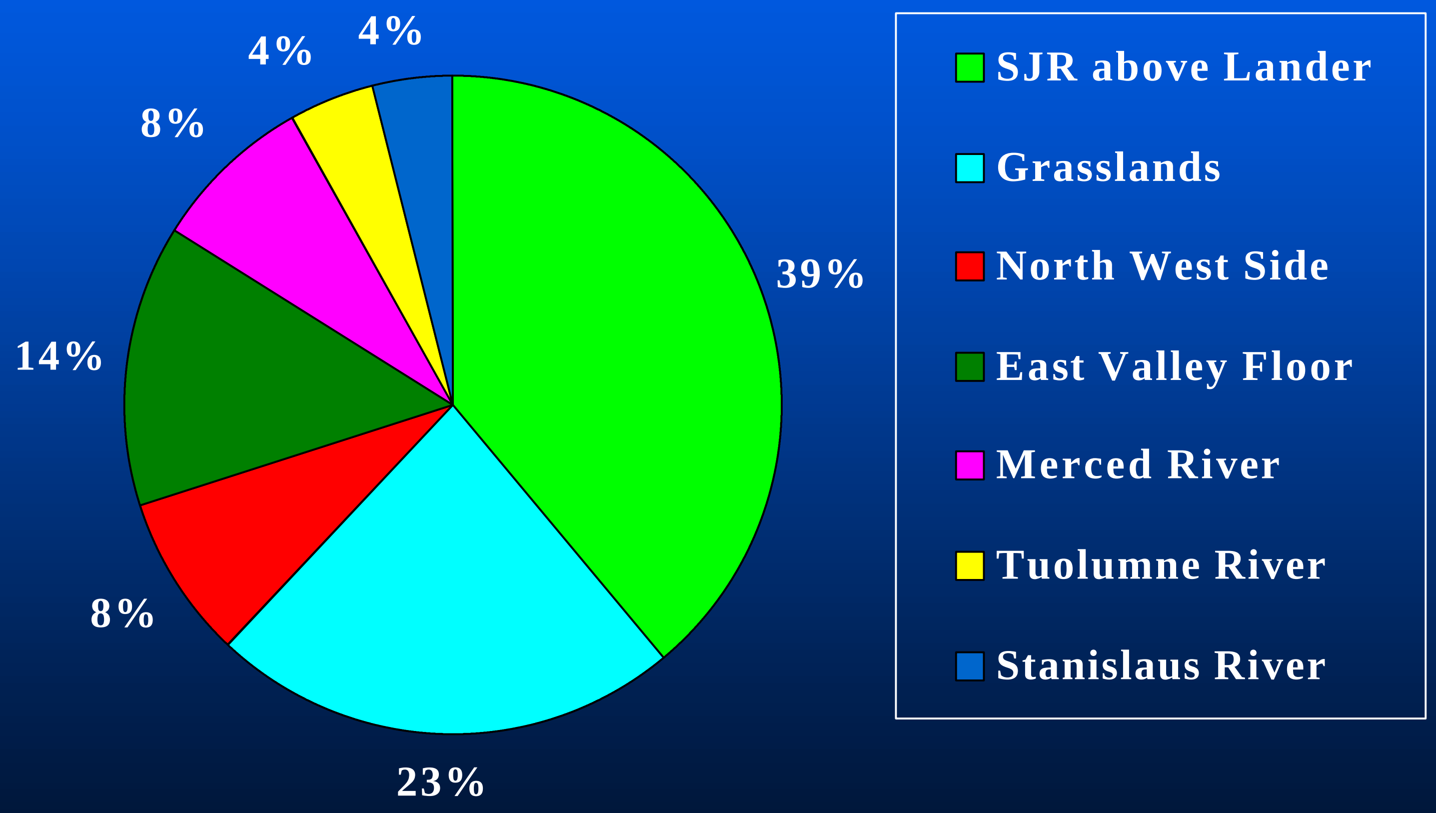
1.4 million acres of agriculture

Lower San Joaquin River Basin Agricultural Land Use

Sub-area	Agriculture	Managed Wetlands	Total
SJR above Lander	561	45	606
Grasslands	331	115	446
North West Side	118	--	118
East Valley Floor	199	--	199
Merced River	111	--	111
Tuolumne River	53	--	53
Stanislaus River	52	--	52

in 1000 acres

Lower San Joaquin River Basin Agricultural/Wetland Land Use

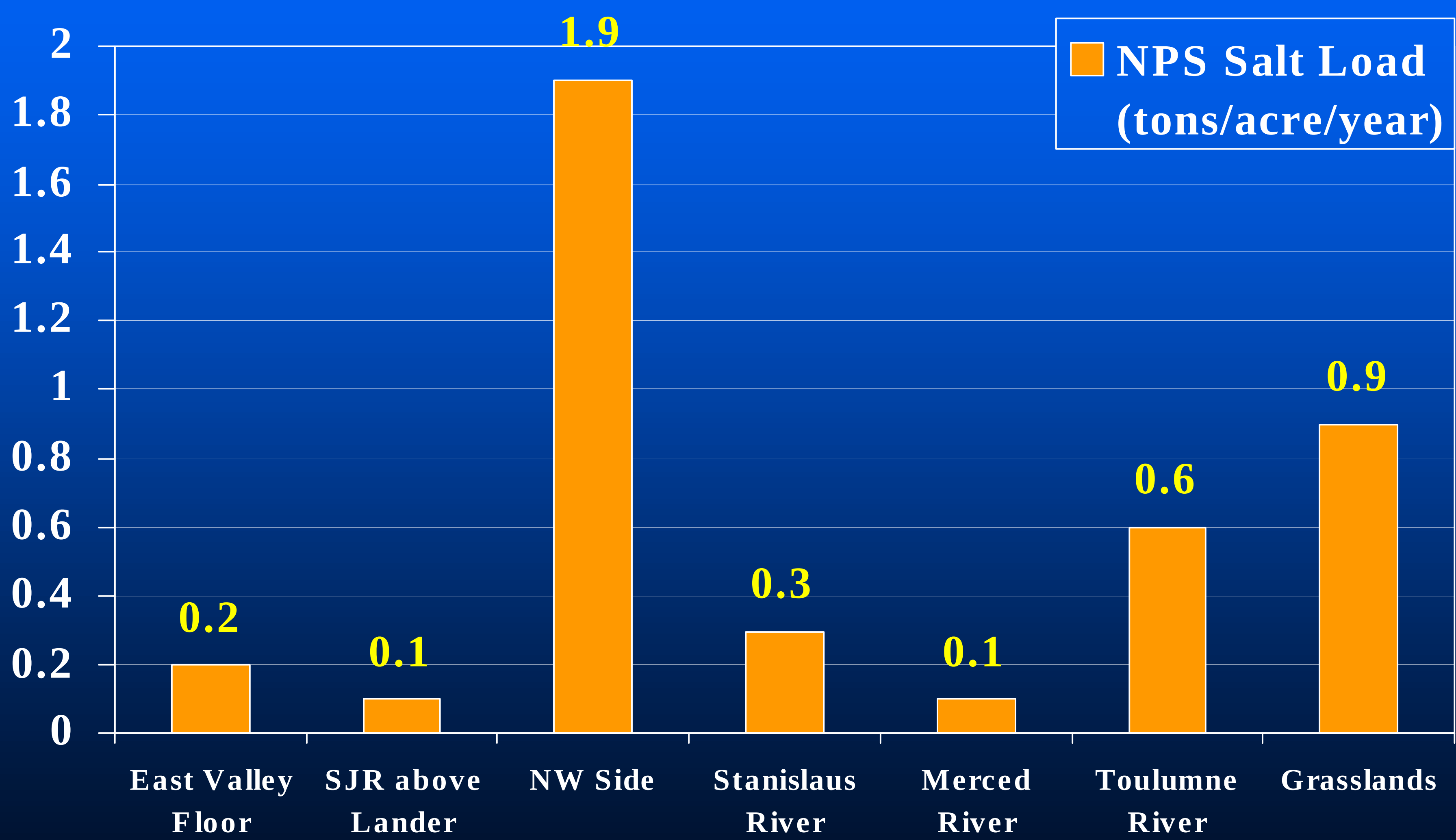


Non Point Source Loading
(Per Acre by Sub-area)

SUB-AREA	NPS (1000 acres)	NPS Loads (tons/year)	NPS Load (tons/acre/year)
SJR above Lander	606	32,446	0.1
Grasslands	446	400,000	0.90
North West Side	118	218,864	1.9
East Valley Floor	199	33,507	0.2
Merced River	111	15,256	0.1
Tuolumne River	53	33,382	0.6
Stanislaus River	52	16,328	0.3

Non Point Source Loading

(Per Acre by Sub-area)



TMDL Loading Capacity

Objective:

- Determine the load reductions needed to achieve water quality targets.
- Establish relationship between pollutant sources and in-stream numeric targets

Components of Loading Capacity

1) Design Flow and

2) Real Time

TMDL Loading Capacity

Developing Design Flows:

- Construct a long-term historic flow record projecting current level of water development on past flow regimes (DWR’s CALSIM Model)

- Subdivide flows into season/month and water-year type

TMDL Loading Capacity

Developing design flows:

- Select a low flow that has a desired frequency of occurrence such as 1 in 3 years (e.g. 1 out of 36 months)
- TMDL (Loading Capacity) = WQ objective * design Flow

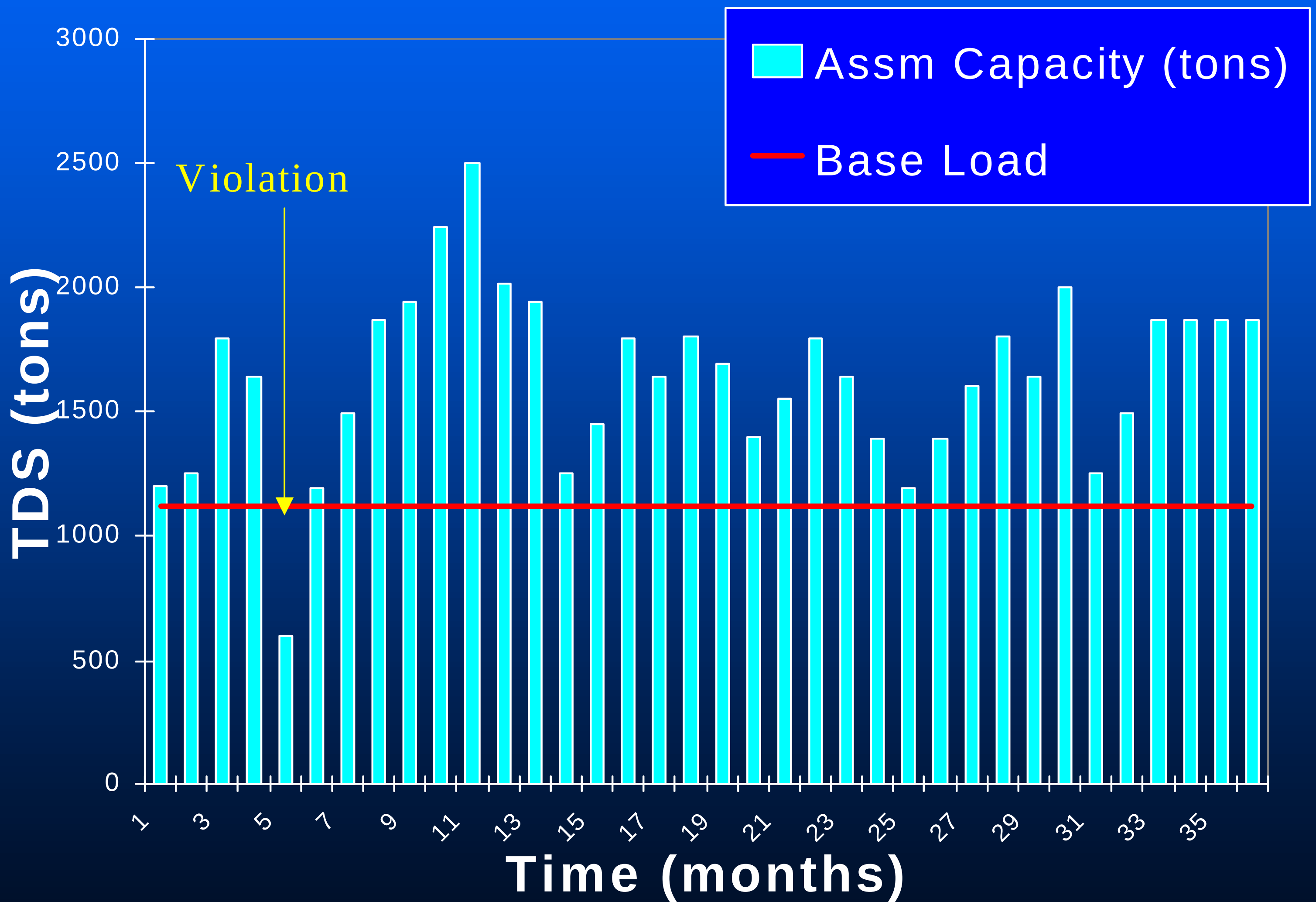
TMDL Loading Capacity

Developing design flows:

Season	Year Type				
	Wet	Above Normal	Below Normal	Dry	Critical
Irrigation					
Non-Irrigation					

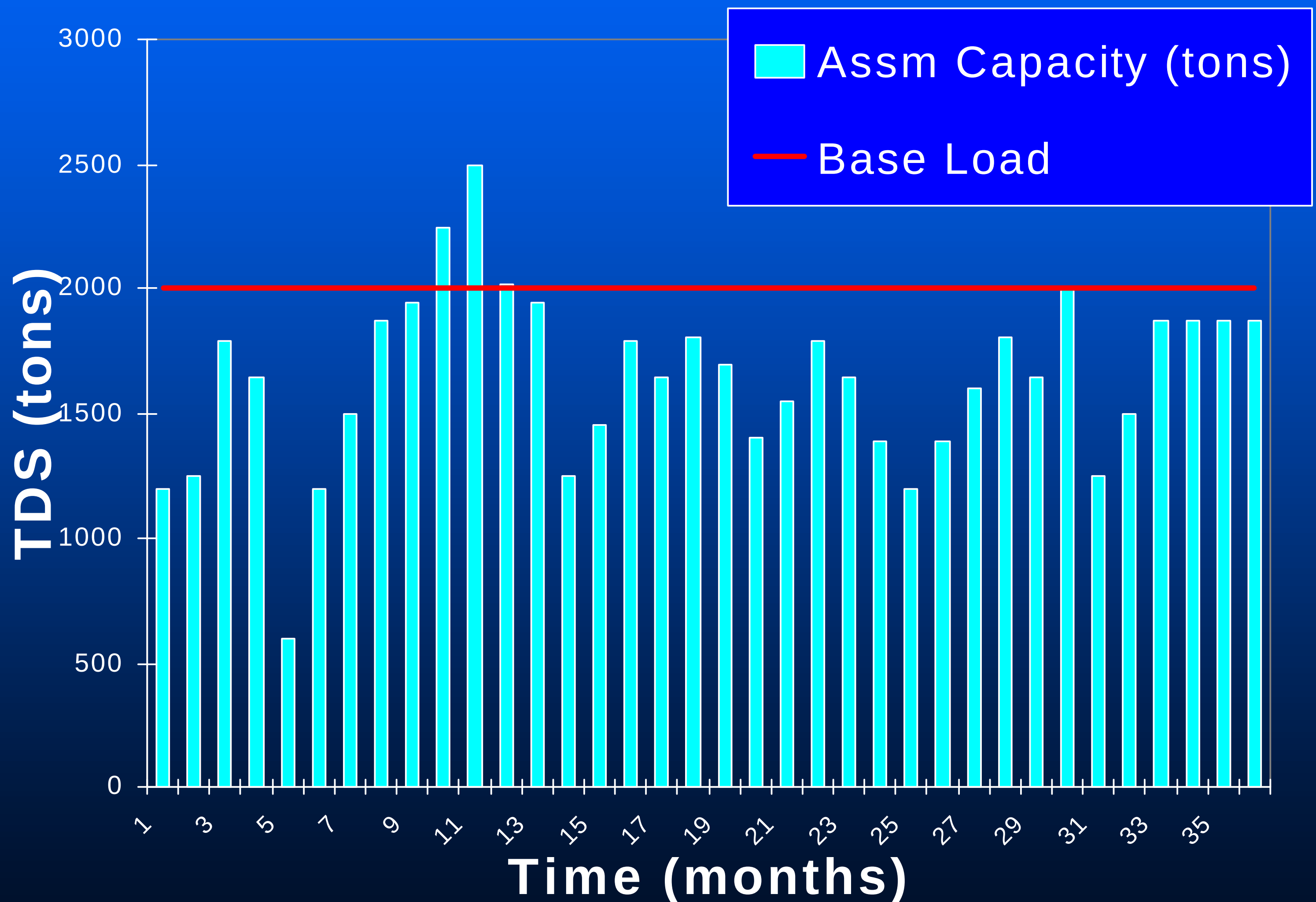
TMDL Loading Capacity

Example of design flow constraints



TMDL Loading Capacity

Example of design flow constraints



TMDL Loading Capacity

Real Time Component: Enables additional loading above and beyond base loads

- Total loading capacity based on real time conditions
- Loading capacity allocated according to a predefined set of parameters
- Load allocations are dynamic

Benefits of Real Time TMDL

- Recognizes that salt and boron do not bioaccumulate

- Recognizes the need to export salts and take advantage of the assimilative capacity of the river while meeting WQ objectives

Prerequisites for use of Real Time Loads

- Development and maintenance of the necessary operational and facilities infrastructure

- Long-term coordinated effort of dischargers

TMDL Load Allocations

Objective:

- Allocate loads to each of the pollutant sources
- Account for and allocate Background Loads
- Use a Margin of Safety to account for uncertainties in the analyses

TMDL Load Allocations

- Regional Board staff are currently evaluating various load allocation approaches

TMDL Load Allocation Principles

- Loads will generally be allocated on a sub-area basis
- Load allocations will be based in part on the area of agriculture and wetlands within each sub-area and based in part on existing drainage needs
- Supply water quality will be considered and responsibility for imported salts will rest with the entities that import salts

Regional Board Next Steps

- Refine Source Assessment and Loading Capacity (determine allowable loading)
- Develop Load Allocation Program
- Hold another workshop and present updated information in approximately 60 days (late April)

Questions/Comments

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